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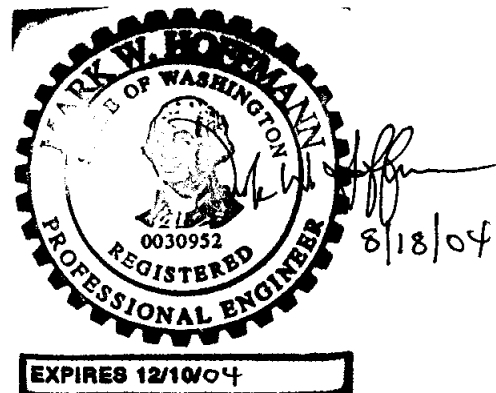
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1 Introduction

The Washington Administrative Code, WAC 173-303, requires the use of secondary containment for systems that contain dangerous waste. This document provides a brief description of the secondary containment sumps for the C3 and C5 effluent vessel cells, and the pump and piping pits of the River Protection Project – Hanford Tank Waste Treatment and Immobilization Plant (WTP), Analytical Laboratory (LAB) facility. These sumps are listed in Table 1. Drains associated with these sumps are an extension of the secondary containment system and are described in Table 2.

2 Applicable Documents

WAC 173-303. *Dangerous Waste Regulations*. Washington Administrative Code.

3 Description

3.1 Effluent Vessel Cell Sumps

There are two dangerous waste sumps located in the dangerous waste vessel cells of the LAB facility. The first sump is located in the C3 effluent vessel cell (A-B003). It is part of the secondary containment system for the laboratory area sink drain collection vessel, RLD-VSL-00164. Throughout the balance of this sump data document, it will be referred to as the C3 cell sump (RLD-SUMP-00041). The second sump is located in the C5 effluent vessel cell (A-B004). It is part of the secondary containment system for the hotcell drain collection vessel, RLD-VSL-00165. Throughout the balance of this sump data document, it will be referred to as the C5 cell sump (RLD-SUMP-00042). Both sumps are of a dry-type design.

3.1.1 C3 Cell Sump (RLD-SUMP-00041)

The top of the C3 cell sump is located in the C3 effluent vessel cell (A-B003) at top-of-concrete (TOC) elevation (–) 18 ft-7 in. The cell is lined with stainless steel for secondary containment. The sump is of stainless steel construction and interfaces with the cell liner to form an integral boundary. The slope of the cell floor diverts any effluents towards the sump. The sump is 30 inches nominal diameter and approximately 13 inches deep. The sump is made from a piece of nominal pipe size (NPS 30) standard-wall pipe (or an equivalent rolled plate) and a 30-in diameter, standard-wall, pipe cap (or equivalent ellipsoidal-head section) and has a nominal volume of 30 gallons. The sump is equipped with radar level detection. Furthermore, the sump is emptied by pump RLD-PMP-00182A or 00182B into vessel RLD-VSL-00165, hotcell drain collection vessel (C5 vessel), located in room A-B004, or emptied into RLD-VSL-00164, lab area sink drain collection vessel (C3 vessel), located in room A-B003. There are no embedded drain lines in the sump that form an extension of the secondary containment boundary.

3.1.2 C5 Cell Sump (RLD-SUMP-00042)

The top of the C5 cell sump is located in the C5 effluent vessel cell (A-B004) at TOC elevation (-) 19 ft-2 in. The sump is similar to the one described in section 3.1.1 above. The sump is equipped with radar level detection and is emptied via pumps RLD-PMP-00183A or RLD-PMP-00183B into the plant wash vessel, PWD-VSL-00044, in the Pretreatment Facility through a buried, double-pipe (duplex) transfer line or emptied into vessel RLD-VSL-00165, hotcell drain collection vessel (C5 vessel) in room A-B004.

3.2 Pump and Piping Pit Sumps

There are four dangerous waste sumps located in the pump and piping pits of the LAB facility. One sump is located in the C3 pump pit (A-B002). It is part of the secondary containment system for the laboratory area sink drain collection vessel, RLD-VSL-00164 (C3 vessel). Throughout the balance of this sump data document, it will be referred to as the C3 pump pit sump (RLD-SUMP-00045).

The other three sumps are enumerated below:

| Room Name | Room Number | Sump Name | Sump Number |
|---------------------|-------------|--------------------|-----------------|
| C5 Pump Pit (South) | A-B007 | C5 Pump Pit Sump | RLD-SUMP-00043A |
| C5 Piping Pit | A-B006 | C5 Piping Pit Sump | RLD-SUMP-00044 |
| C5 Pump Pit (North) | A-B005 | C5 Pump Pit Sump | RLD-SUMP-00043B |

These sumps are part of the secondary containment system for the hotcell drain collection vessel, RLD-VSL-00165 (C5 vessel). Throughout the balance of this sump data document, they will be referred to by the aforementioned sump names and numbers.

All four sumps are of a dry-type design.

3.2.1 C3 Pump Pit Sump (RLD-SUMP-00045)

The bottom of the C3 pump pit sump is located in the C3 pump pit (A-B002) at TOC elevation (-) 6 ft-8 1/2 in. The pit is lined with stainless steel for secondary containment and ease of decontamination prior to anticipated maintenance activities in the area. The liner on the floor of the pit consists of several sloped plates that direct potential leakage and washwater (during maintenance) to a drain located at the lowest point in the pit. The sump is formed by a rectangular depression in the liner around the drain. Hence, the sump is an integral part of the pit liner.

The sump drain includes a removable weir and instrumentation to provide both leak detection capabilities and the ability to completely empty the sump. With the weir installed, a detectable level is formed in the sump to allow the radar detector to sense potential leaks. Persistent leakage spills over the weir and returns to the laboratory area sink drain collection vessel, RLD-VSL-00164 (C3 vessel). In the event that leakage is detected, an operator manually removes the weir from the sump via an extended drive spindle and allows the sump to drain. The operator then diagnoses the source of the leak. The weir may also be removed during maintenance to preclude the accumulation of a residual volume of washwater in the sump.

As in the case of the cell sumps, level detection for the pit sump is accomplished using the radar level measurement leak-detection method. The volume of the sump is equal to the volume created by the

depression in the liner in the vicinity of the drain and the height of the weir. This volume is limited to a maximum value of 2.4 gallons in order to be able to detect a design basis leak of 0.1 gal/h in 24 hours. Moreover, a stainless steel pipe directs weir overflow and sump drainage to the laboratory area sink drain collection vessel, RLD-VSL-00164 (C3 vessel). Flow to this vessel is by gravity.

The drain line from the C3 pump pit sump is located entirely within the C3 effluent vessel cell (A-B003). Hence, secondary containment and leak detection for this drain line is provided by the C3 effluent vessel cell and the associated radar leak detection system.

3.2.2 C5 Pump Pit Sumps (RLD-SUMP-00043A and RLD-SUMP-00043B) and C5 Piping Pit Sump (RLD-SUMP-00044)

The bottom of the C5 pump pit sumps (RLD-SUMP-0043A and RLD-SUMP-00043B) and C5 piping pit sump (RLD-SUMP-00044) are located in their respective pit at TOC elevation (-) 6 ft-7 in. The design of each of these three sumps is similar to the one described in section 3.2.1 above. The primary difference is that all three sumps drain to RLD-VSL-00165, hotcell drain collection vessel (C5 vessel) via a common drainline. The drain line from the two C5 pump pit sumps and the one C5 piping pit sump is located entirely within the C5 effluent vessel cell (A-B004). Hence, secondary containment and leak detection for this drain line is provided by the C5 effluent vessel cell and the associated radar leak detection system.

Table 1 Analytical Laboratory Sump Data

| Index No. | Sump PIN | LAB Room Number & TOC Elevation | Nominal Sump Capacity (in US Gallons) | Sump Type | Sump Dimensions | Piping and Instrumentation Diagram Number (24590-LAB-M6-) | Leak Detection Type | Material of Fabrication |
|-----------|-----------------|--|---------------------------------------|-----------|--|---|---------------------|--|
| 1 | RLD-SUMP-00041 | A-B003 (-) 18 ft-7 in. (top) | 30 | Dry | 30 in. dia. x approx. 13 in. deep [NPS 30 standard-wall pipe (or equivalent plate) and 30-in dia., standard-wall pipe cap (or equivalent ellipsoidal-head section)] | RLD-P0002 | Radar | Stainless Steel UNS N08367 (6% Mo) |
| 2 | RLD-SUMP-00042 | A-B004 (-) 19 ft-2 in. (top) | 30 | Dry | 30 in. dia. x approx. 13 in. deep [NPS 30 standard-wall pipe (or equivalent plate) and 30-in dia., standard-wall pipe cap (or equivalent ellipsoidal-head section)] | RLD-P0001 | Radar | Stainless Steel UNS N08367 (6% Mo) |
| 3 | RLD-SUMP-00043A | A-B007 (-) 6 ft-7 in. (bottom) | 1.40 | Dry | Volume formed by a local depression in the liner 1.5 ft x 3.0 ft x height of a 1/2-in. weir. | RLD-P0001 | Radar | Stainless Steel (SS 304L or higher grade) |
| 4 | RLD-SUMP-00043B | A-B005 (-) 6 ft-7 in. (bottom) | 1.40 | Dry | Volume formed by a local depression in the liner 1.5 ft x 3.0 ft x height of a 1/2-in. weir. | RLD-P0001 | Radar | Stainless Steel (SS 304L or higher grade) |
| 5 | RLD-SUMP-00044 | A-B006 (-) 6 ft-7 in. (bottom) | 1.56 | Dry | Volume formed by a local depression in the liner 2.0 ft x 2.5 ft x height of a 1/2-in. weir. | RLD-P0001 | Radar | Stainless Steel (SS 304L or higher grade) |
| 6 | RLD-SUMP-00045 | A-B002 (-) 6 ft-8 1/2 in. (bottom) | 1.56 | Dry | Volume formed by a local depression in the liner 2.0 ft x 2.5 ft x height of a 1/2-in. weir. | RLD-P0002 | Radar | Stainless Steel (SS 304L or higher grade) |

Table 2 Analytical Laboratory Sump Drain Data

| Index Number | Sump Drain Line & Sump Number | LAB Room Number & Name | Nominal Drain Line Capacity (US gal/min) | Drain Line Size (nominal pipe size) | Piping and Instrumentation Diagram Number (24590-LAB-M6-) | Leak Detection Type | Material of Fabrication |
|--------------|---|---------------------------------|--|-------------------------------------|---|---------------------|-------------------------|
| 1 | RLD-WU-02207-S11E-04, RLD-SUMP-00045 | A-B003, C3 Effluent Vessel Cell | 86 | 4 | RLD-P0002 | Not Applicable | Stainless Steel 316L |
| 2 | RLD-ZN-02203-S11E-04, RLD-SUMP-00043A (common line) | A-B004, C5 Effluent Vessel Cell | 86 | 4 | RLD-P0001 | Not Applicable | Stainless Steel 316L |
| 3 | RLD-ZN-03393-S11E-04, RLD-SUMP-00043B | A-B004, C5 Effluent Vessel Cell | 86 | 4 | RLD-P0001 | Not Applicable | Stainless Steel 316L |
| 4 | RLD-ZN-03394-S11E-04, RLD-SUMP-00044 | A-B004, C5 Effluent Vessel Cell | 86 | 4 | RLD-P0001 | Not Applicable | Stainless Steel 316L |